

CHAPTER 2FRAILROADS2F-01. GENERAL

This chapter covers the inspection of railroad construction, including ballast, sub-ballast and track materials on a previously prepared sub-grade

a. Contract Documents

In addition to the plans and specifications and shop drawings, QC/QA should have a copy of the latest American Railway Engineering Association publication and should be familiar with its contents.

b. Work on Lines Adjacent to In-service Lines

(1) Prior to commencement of work, check to see that arrangements have been made with the adjacent railroad for provision of flagmen, light signals, slow boards or other requirements of the railroad or ICC Regulations for the protection of equipment and personnel of both parties.

(2) Check to ensure coordination of action when tie-in between new and existing construction is to be made.

c. Work on Lines Crossing Roads or Highways

Prior to commencement of work, check for coordination between the contractor and state or local authorities for detours, barricades, crossing guards, lights and similar related items.

2F-02. SUB-GRADEa. Sub-grade Prepared Under Another Contract

(1) Check angle of repose and erosion of side slopes in cut and fill sections.

(2) Check for drainage between roadbed and bank in cut sections. Are culverts installed as required?

(3) Check size, shape, grading and compaction of roadbed.

(4) To avoid possibility of claims, secure acceptance of existing roadbed by railroad contractor.

b. Sub-grade Prepared Under Railroad Contract

(1) Review appropriate chapter of manual pertaining to placement of fill.

(2) Check for removal of unsuitable materials in cut sections.

(3) Check fill materials for acceptability as stated in specifications.

(4) Check for compliance with specifications in placing, compacting and grading fill.

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(5) Check for proper methods of construction on slopes in fill sections and that correct slopes are maintained in both cut and fill sections.

(6) Check for compliance with plans as to drainage facilities, size, shape, location, methods of construction and materials.

(7) Ensure that work areas are graded to drain when work is stopped for any reason. Check daily, weekends, and when progressing to new areas.

2F-03. MATERIALS

a. All materials, equipment and supplies shall be new and in unused condition, unless otherwise specified, and should conform to applicable standards.

b. If materials are Government-furnished, an inventory should be made with the contractor as to condition, quality, quantity and a receipt obtained from the contractor. Your supervisor should be notified immediately of unsuitable or insufficient materials.

c. All of the following items shall be checked for compliance with approved samples, certificates of compliance, plans, specifications or applicable Federal or other standards, as the case may require:

(1) Ballast - Check for type, quality, soundness, gradation and continued conformity with previously approved materials.

(2) Ties - Check species, size, method of treatment and condition. Check for anti-splitting device installed on each end of hardwood ties,

(3) Rail - Check for length, weight and section, condition, and drilling pattern.

(a) Rails may be bent or straightened only with appropriate bending devices, not with sledge hammer or localized application of heat.

(b) Chipped or cracked rails must be set aside.

(4) Joint Bars - Check for drilling condition, weight, type and size.

(5) Tie Plates - Check for punching, size, weight, condition and type.

(6) Track Bolts, Nuts, Spring Washers - Check for condition and size.

(7) Track Spikes - Check for condition, type and size.

(8) Tie Plugs - Check for size and preservative treatment.

(9) Turnouts - Check all metal material for condition, size, number, weight, section, and length as appropriate.

(10) Switch Stands - Check for compliance with submittals.

(11) Rail Anchors - Check for size, weight, condition and number of each type or size required.

(12) Derails - Check for size, condition, and the number of each size required by plans.

(13) Bumpers - Check for conformity with submittals and number required.

(14) Signal Equipment - If required, shall be checked for compliance with submittals and specifications, as applicable.

2F-04. TRACK CONSTRUCTION

a. Contractor Operation

Discuss the contractor*s complete operation with him during the preparatory inspection.

(1) Check the schedule of operation to assure that it is in compliance with contract requirements.

(2) Check equipment proposed. Do not allow the use of equipment that will rut or damage the roadbed.

(3) Check storage and handling of material procedures.

(4) Check sequence of operation.

b. Roadbed

The roadbed should be constructed sufficiently far in advance of track laying operations to avoid slow down of this work.

(1) Depressions should be filled and compacted.

(2) Sub-grade should be graded to provide drainage under the ballast when required,

c. Ballast

Ballast should be placed to the depth and cross section indicated on the plans.

(1) Watch for contamination with sub-soil or other foreign materials which might impair drainage qualities.

(2) Placing of ballast will be done, in part, prior to placing of ties or completely after placing of ties and rails in accordance with the provisions of the specifications.

d. Ties

(1) Ties should be laid with the heartwood face or the widest surface down.

(2) Check spacing of ties by counting number per rail.

(3) Select ties so that the best ones are used at rail joints.

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(4) The handling and placing of ties with tapping-pick, spike-mauls, sledges and shovel should not be permitted. Ties should be handled only with tongs.

(5) Check the surfaces of the ties to assure that full bearing is provided for the tie plate.

(6) Check that ballast if tamped under ties to provide a firm bearing for tie track has been raised to grade.

(7) The end of ties shall be aligned at the same side of the track.

(8) Tamping stone ballast will normally be done from a point 15 inches inside each rail on both sides of the ties to the ends of the ties. Tamping shall not be permitted in the center of the tie between the above stated limits; this center shall be filled lightly with ballast using a ballast form or shovel.

(9) All cut surfaces of ties should be slushed with creosote oil and holes left by withdrawn spikes should be slushed with creosote oil and plugged with proper size creosoted plugs, cut-off flush.

e. Rails

(1) Check method of laying. Watch for bumping and striking of rails.

(2) If more than one rail section is authorized, the different sections should not be mingled.

(3) Check for staggering of joints.

(4) Rails should be laid to standard gage (4' 8-1/2") except on curves over degrees, where specified tolerances will be observed.

(5) Check spacer shims between rail ends to see that provision is made for expansion of rails as established in the project specifications.

(6) Check drilling and sawing. Do not permit use of a torch.

(7) Check for proper number, location, and size of bolt holes permitted. A variation up to 1/32-inch in location of the bolt hole will be permitted.

(8) Rails should be laid on curves with the super elevation maintained throughout the circular part of the curve and run off in the spiral portion of the curve.

(9) The weight, make and location of different weight rails should be shown on the as-built drawings.

f. Tie Plates

(1) Check size, punching and type of tie plates being used.

(2) Check, that bottom of rail, the tie plate, and the bearing surface of the tie are clean to provide full bearing.

(3) Check spiking.

g. Joint Bars

(1) Check for correct number, spacing and correct size of holes to mate with rail holes.

(2) Check, after installation, for correct number and size of bolts, nuts and spring washers. Nuts must have full thread on bolts.

(3) If more than one rail section is authorized check for use of proper compromise joints between rails of different weight.

h. Spiking

(1) Check driving of spikes. They shall be driven plumb with one face in contact with the rail. Those driven out of plumb or sledged to rail should be removed and replaced.

(2) Bent spikes will not be permitted.

(3) Check staggering of spikes on the ties to prevent splitting of ties.

(4) Check number of spikes being placed.

(5) Check spiking on tangents and curves. (Four holding spikes on tangents and six on curves.) Spikes to be staggered with outside spikes in each tie near the same edge and inside spikes near the opposite edge.

(6) Check driving of spikes. Do not over-drive.

i. Rail Anchors

(1) Check that rail anchors are being installed in the locations indicated on the drawings.

(2) Check proper positioning against ties and securing to rail.

j. Turnouts and Crossovers

(1) Check locations, sizes, types and installation.

(2) Locations, sizes, etc. should be made a matter of record.

(3) Check that all moving parts are oiled and switch is in proper adjustment so that for each position the points are held tightly against rails.

k. Guard Rails

Check for location, rail section, spiking, and spacing.

1. Derails and Bumpers

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- (1) Check accuracy of location of derails and bumpers.
- (2) Check for secure anchorage.

m. Oiling Track Fixtures

Check for oiling of track bolts, joint bars and fishing spaces of rails.

n. Clearances

(1) Prior to actual construction, overhead and side clearances should be checked for compliance with regulations of the switching railroad, unless otherwise specified.

(2) During and after construction, overhead and side clearances should be checked at track side structures erected under other contracts.

o. Signal Devices (Electric)

If bonding of rails is required for signal systems, or other reasons, the bonding wires should be checked for correct type and proper installation. If insulation joints are required, check that they are provided where and as specified.

2F-05. SAFETY

Continuing check shall be made to secure compliance with applicable safety requirements of Federal (ICC), State, Local, adjacent railroads and the Corps of Engineers "Safety and Health Requirements Manual".